

## **REMARKS**

The Applicant has received and reviewed the Office Action dated May 12, 2006 wherein the Office rejected claims 1-5 and 9 under 35 U.S.C. §102(b) as being anticipated by the reference of Takahashi (U.S. Patent No. 5,136,681); rejected claims 1, 3, 5-7 and 9 under 35 U.S.C. §102(e) as being anticipated by the reference of Jones et al. (U.S. Patent Publication No. 2004/0096178); rejected claims 8, 10-13, 16, and 18-20 under 35 U.S.C. §103(a) as being unpatentable over the reference of Takahashi; rejected claims 2, 14, and 17 under 35 U.S.C. §103(a) as being unpatentable over the reference of Takahashi in view of the reference of Snow et al. (U.S. Patent 5,039,193); and rejected claim 15 under 35 U.S.C. §103(a) as being unpatentable over the reference of Takahashi in view of the reference of Snow et al.

### **Rejection under 35 U.S.C §102(b) to Takahashi**

Applicant's claims 1-5 and 9 stand rejected under 35 U.S.C. §102(b) as being anticipated by the reference of Takahashi (U.S. Patent No. 5,136,681). The Applicant respectfully disagrees with the Office's aforementioned rejection.

Referring to Applicant's independent claim1, Applicant's independent claim 1 is directed to a single optical coupler (see for example either optical coupler 10 or optical coupler 30 in Figures 3 and 4) that contains two optical fibers that are rotatably mounted with respect to each other. The Applicant respectfully submits that the reference of Takahashi '681 does not teach the aforementioned feature of Applicant's independent claim 1.

On page 3, lines 3-8 of the Office Action in support of the Office's rejection, the Office stated:

"Regarding independent claim 1, Takahashi teaches an optical coupler shown best in figure 3. The coupler comprises a first optical fiber (33) in a ferrule (41). A second optical fiber (34) is rotatably mounted with respect to the first optical fiber (33) with the end of the first optical fiber proximate an end of the second optical fiber (see column 4, lines 44-50) while permitting rotation thereof ..."

The Applicant respectfully but strenuously disagrees with the Office's above statement.

The Applicant submits that the overall unit or device shown in Takahashi's Figures 3 and 4 is not an optical coupler but instead is specifically described by Takahashi in column 4, lines 51-55 as an "optical attenuator of the variable attenuation type" that comprises a first optical connector plug 31, a second optical connector plug 32, and an alignment adapter 59. The alignment adapter 59 is shown in Takahashi's Figures 3 and 4 connecting the first optical connector plug 31 to the second optical connector plug 32.

In view of the above, the Applicant respectfully submits that Takahashi's optical fiber 33 and optical fiber 34 are not both located in Takahashi's first optical connector plug 31 or Takahashi's second optical connector plug 32.

Applicant's independent claim 1 also calls for an end of the first optical fiber positioned proximate an end of the second optical fiber to permit transfer of an optical signal between the two optical fibers while permitting rotation between the two optical fibers.

The Applicant respectfully submits that the reference of Takahashi '681 does not teach the above feature of Applicant's independent claim 1. It is first noted that Takahashi '681 does not teach the rotation of Takahashi '681's optical fibers 33 and 34 but instead teaches the revolving of Takahashi '681's ferrule, and more specifically, the revolving of Takahashi '681's ferrule 42 caused by the operator's revolving of Takahashi '681's knob 42c in order to obtain a desired attenuation value. (See column 5, lines 64-67 and column 6, lines 1-4.) The Applicant submits that Takahashi '681's ferrule is different from Takahashi '681's optical fibers 33 and 34.

It is also noted that Takahashi '681's does not permit transfer of an optical signal between the two optical fibers while permitting rotation between the two optical fibers. Although Takahashi '681 teaches the revolving of Takahashi '681's ferrule 42, the revolving of Takahashi '681's ferrule 42 occurs before a transfer of an optical power. More specifically, Takahashi '681 teaches that once the desired attenuation value is obtained by the revolving of the ferrule 42, an adhesive agent is then "... poured into the gap between ferrule 42 and holder 52..." to fasten ferrule 42 to holder 52, and set the desired attenuation value. (See column 6, lines 1-8.) Note in column 6, lines 13-14 wherein Takahashi '681 discloses "... the attenuation which has been set before cannot change after readjustment." (Emphasis added.) The Applicant submits that it is only after the desired attenuation value is set in Takahashi '681's device does a transfer of an optical power occur. In view of the aforementioned, it is submitted that Takahashi '681's does not permit transfer of an optical signal between the two optical fibers while permitting rotation between the two optical fibers.

It is for the above reasons that the Applicant respectfully submits that Applicant's independent claim 1 is allowable over the reference of Takahashi '681.

In regards to Applicant's dependent claim 6, Applicant's dependent claim 6 calls for the optical coupler of claim 1 including:

"... a flanged member holding the first optical fiber and a rotatable member comprises a further flanged member holding the further optical fiber." (Emphasis added)

On page 3, lines 13-15 of the Office Action, in support of the Office's rejection of dependent claim 6, the Office state:

"The coupler includes a flanged member (51) holding the first optical fiber (33) and a second flanged member (52) holding the second optical fiber (34)."

The Applicant respectfully disagrees with the Office's above statement as Takahashi '681's holders 51 and 52 do not hold optical fibers 33 and 35 but instead hold's Takahashi '681's ferrules 41 and 42.

In regards to Applicant's dependent claim 7, Applicant's dependent claim 7 calls for the optical coupler of claim 6 wherein:

"...a U-shaped member holds the flanged member and the further flanged member in rotational engagement with each other." (Emphasis added)

On page 3, lines 16-18 of the Office Action, in support of the Office's rejection of dependent claim 7, the Office state:

"A U-shaped member (57 and 58) holds the first and second flanged members in rotational engagement with each other."

The Applicant strenuously disagrees with the Office's above statement as Takahashi '681's coupling nuts 57 and 58 do not hold a first and second flanged members or even hold Takahashi '681's holders 51 and 52 (which the Office previously stated were flanged members) in rotational engagement with each other. Note that Takahashi '681's holders 51 and 52, which the Office again stated were flanged members, are not in rotational engagement with each other. (See Takahashi '681's Figures 3 and 4).

It is for the above reasons that the Applicant respectfully submits that Applicant's dependent claims 6 and 7 are allowable over the reference of Takahashi '681.

**Rejection under 35 U.S.C §102(e) to Jones et al.**

Applicant's claims 1-5 and 9 stand rejected under 35 U.S.C. §102(e) as being anticipated by the reference of Jones et al. (U.S. Patent Publication No. 2004/0096178). On page 4, lines 3-11 of the Office Action, in support of the Office's above rejection, the Office stated:

"Regarding independent claim 1, Jones et al teaches an optical coupler shown best in figure 6 comprising a first optical fiber within a ferrule (61) and a second optical fiber in a ferrule (62). Jones et al teach that the ferrule bores hold optical fibers (see second paragraph of the abstract). Hereinafter, the reference numbers of ferrules will be used to reference the ferrules and the optical fibers contained therein. The second optical fiber (62) is rotatably mounted with respect to the

first optical fiber (61) with an end of the first optical fiber positioned proximate an end of the second optical fiber as seen in figure 6 (see paragraph 37). An optical signal is transferred between the first and second fibers (see paragraphs 8 and 9) while permitting rotation of second optical fiber (see paragraphs 37-39)."

The Applicant respectfully disagrees with the Office's above statement. Referring to Applicant's independent claim 1, Applicant's independent claim 1 is directed to a single optical coupler (see for example either optical coupler 10 or optical coupler 30 in Figures 3 and 4). Referring to Applicant's Figures 3 and 4, note that the single optical coupler (either optical coupler 10 or optical coupler 30) is a part of an optical coupling assembly comprising a first optical coupler 10, a second optical coupler 30 and alignment sleeve 25 connecting the first optical couple 10 to a second optical couple 30. The Applicant submits that the device shown in Jones et al.'s Figure 6 is not a single optical coupler as called for in Applicant's independent claim 1 but instead is an entire optical coupling assembly unit.

The Applicant further submits that the reference of Jones et al. does not teach a single optical coupler containing two optical fibers that are rotatably mounted with respect to each other but instead teaches an optical coupling assembly unit that includes a first stationary ferrule 19, a second stationary ferrule 63 and a third ferrule 62 located between the first stationary ferrule 61 and second stationary ferrule 63 with the third ferrule 62 rotatably mounted with respect to the first and second stationary ferrules 61, 63.

Applicant's independent claim 1 also calls for an end of the first optical fiber positioned proximate an end of the second optical fiber to permit transfer of an optical signal

between the two optical fibers while permitting rotation between the two optical fibers.

The Applicant respectfully submits that the reference of Jones et al. does not teach the aforementioned feature of Applicant's independent claim 1. Referring to Figures 2a and 2b of Jones et al., note that Jones et al. teaches that the bore 57 for receiving the optical fiber is:

“...displaced from the centerline of rod 56 a distance B approximately 35-40 microns, and which is parallel to the centerline of rod 56.” (Emphasis added.)

It is submitted that the displacement of Jones et al.'s bore 57 from the centerline of Jones et al.'s rod 56 prevents the transfer of an optical signal between the two optical fibers of Jones et al.'s optical coupling assembly (when the two optical fibers of Jones et al.'s optical coupling assembly are misaligned) while permitting rotation between the two optical fibers.

It is for the above reasons that the Applicant respectfully submits that Applicant's independent claim 1 is allowable over the reference of Jones et al.'s.

In regards to Applicant's dependent claim 4, Applicant's dependent claim 4 calls for the optical coupler of claim 3 including:

“...a second optical coupler mounted in the alignment sleeve.” (Emphasis added)

On page 4, lines 19-22 of the Office Action, in support of the Office's rejection of dependent claim 6, the Office state:

“... Jones et al teach an optical coupler as discussed above in reference to claims 3. A second optical coupler is located in the alignment sleeve (105). The second coupling is between the second fiber (62) and a third fiber (63)....”

The Applicant strenuously disagrees with the Office’s above statement as a review of Figure 7 of Jones et al.’s reveals that Jones et al. lacks a second optical coupler located between Jones et al.’s alignment sleeve 105. Instead, Jones et al.’s Figure 7 only shows a portion of ferrules 62 and 63 along with index matching material 108 located in Jones et al.’s alignment sleeve 105. It is further submitted that the reference of Jones et al. also does not teach an alignment sleeve mounted on both a first optical coupler and a second optical coupler as called for in Applicant’s dependent claim 4. Note that Jones et al. instead teaches the use of two separate sleeves 105, a first sleeve to attach Jones et al.’s first ferrule 61 to Jones et al.’s second ferrule and a second sleeve to attach Jones et al.’s second ferrule 62 to Jones et al.’s third ferrule 63. (See Figure 7 of Jones et al.)

It is for the above reasons that the Applicant respectfully submits that Applicant’s dependent claim 4 is allowable over the reference of Jones et al..

**Rejection under 35 U.S.C §103(a) to Takahashi**

Applicant’s claims 8, 10-13, 16, and 18-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the reference of Takahashi.

In regards to Applicant’s independent claims 8, 10, 11, and 16, Applicant’s claims 8, 10, 11 each calls optical fibers having an angle cut face or an angle cut terminus. Applicant’s claim 16 calls for the step of “...forming a coupling angle cut face on the terminus of the

optical lead..." The Applicant submits that the reference of Takahashi '681 does not teach Takahashi '681's optical fibers 33 and 34 as having an angle cut face or angle cut terminus as called for in Applicant's claims 8, 10, and 11, or the step of "...forming a coupling angle cut face on the terminus of the optical lead..." as called for in Applicant's claim 16. In regards to Takahashi '681's ferrules 41 and 42, although Takahashi '681 show ferrules 41 and 42 as each having an angled end, the Applicant submits that Takahashi '681's ferrules 41 and 42 are not optical fibers.

On page 5, lines 17-21 of the Office Action, the Office stated:

"While the reference does not explicitly show a fiber having an angle cut terminus, fibers (33 and 34) are understood to be in the ferrules (41 and 41) to permit light transmission discussed above and it would have been obvious to one of ordinary skill in the art that the fibers would have an end face similar to that of the ferrules."

Although the Applicant agrees with the Office that Takahashi '681 does not show a fiber having an angle cut terminus, the Applicant respectfully disagrees with the Office's statement that Takahashi '681's optical fibers 33 and 34 have angle cut terminus because Takahashi '681's ferrules 41 and 42 have angle cut terminus. Referring to Takahashi '681's Figure 4, the Applicant submit that the transfer of an optical power can occur with the presence of a gap/space located between the ferrule and in turn the optical fibers as evidence in Takahashi '681's Figure 4 and Takahashi '681's column 6, lines 29-43.

Since the transfer of optical power can occur with the presence of a gap/space located between the ferrule and in turn the optical fibers, the Applicant respectfully submits that

the aforementioned is evidence that the presence of the angle cut terminus on Takahashi ‘681’s ferrules 41 and 42 does not translate into Takahashi ‘681’s optical fibers 33 and 34 having angle cut terminus in order for Takahashi ‘681’s to transfer of optical power.

In further regards to Applicant’s independent claim 11, Applicant’s independent claim 11 calls for an apparatus for optical coupling and optical decoupling that includes “... a rotational joint located on the first optical fiber...” The Applicant respectfully submits that a review of the reference of Takahashi ‘681 reveals that Takahashi ‘681 does not teach a rotational joint located on Takahashi ‘681’s optical fiber 33 or optical fiber 34.

In regards to the Office’s statement on page 4, lines 21-22 that Takahashi ‘681 teaches “... a rotational joint on the first fiber (34) (col. 5, lines 64-68) ...,” the Applicant respectfully but strenuously disagrees with the aforementioned. It is submitted that Takahashi ‘681 does not teach a rotational joint located on Takahashi ‘681’s optical fiber 34. Referring to column 5, lines 64-68, note that Takahashi ‘681 instead teaches “... ferrule 42 can be revolved around the optical axis thereof by a predetermined angle within 180 degrees.” (Emphasis added.) It is submitted that rotating around an optical axis of the first ferrule 41 is different from actually rotating about the first ferrule.

Applicant’s independent claim 11 also calls for an apparatus for optical coupling and optical decoupling that includes:

“...an alignment sleeve for holding the angle cut terminus of the first optical fiber and the angle cut terminus of the second optical fiber in rotational alignment with respect to each other.”

The Applicant respectfully submits that the reference of Takahashi '681 does not teach the above. In regards to Takahashi '681's adapter 59, it is submitted that Takahashi '681's adapter 59 is for supporting Takahashi '681's ferrules 33 and 34 therein and not for holding an angle cut terminus of a first optical fiber and an angle cut terminus of a second optical fiber in rotational alignment.

In further regards to Applicant's independent method claim 16, Applicant's method claim 16 calls for a method of twist free optical coupling that includes the step of "...forming a rotational butt coupled joint in an optical lead having a terminus;..." The Applicant respectfully submits that the reference of Takahashi '681 does not teach the aforementioned step. In regards to Takahashi '681's cylinder 42a, although Takahashi '681's Figure 3 shows Takahashi '681's cylinder 42a as having a terminus, the Applicant submits that Takahashi '681's Figure 3 does not show cylinder 42a as having a rotational butt coupled joint in an optical lead.

It is for the above reasons that the Applicant respectfully submits that Applicant's claims 8, 10, 11, and 16 are allowable over the reference of Takahashi '681.

**Rejection under 35 U.S.C §103(a) to the combination of Takahashi and Snow et al.**

Applicant's claims 2, 14, 15 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the reference of Takahashi 681's in view of the reference of Snow et al. (U.S. Patent 5,039,193).

In regards to Applicant's independent claim 15, independent claim 15 calls for an apparatus for optical coupling and decoupling that includes "...a first optical lead having a butt connectable end ..." and "a second optical lead having a butt connectable end ...".

The Applicant respectfully submits that the combination of the references of Takahashi '681 and Snow et al. does not teach the aforementioned. More specifically, Takahashi '681 does not teach Takahashi '681's optical fibers 33 and 34 having a butt connectable end and Snow et al. does not teach Snow et al.'s optical fibers 16 and 30 having a butt connectable end.

The Applicant notes that although the Office, on page 9, lines 11-12 of the Office Action, stated that Takahashi '681's includes a first optical lead 33 having a butt connectable end, the Office has not provide support for the aforementioned. It is submitted that Takahashi '681's does not teach or even suggest that Takahashi '681's optical fibers 33 and 34 butted up against each other.

Applicant's independent claim 15 also calls for:

"...the second optical lead having an angle cut end face to allow passage of an optical signal through the angle cut end face ..."

It is submitted that the combination of the references of Takahashi '681's and Snow et al. does not teach the above as the references of Takahashi '681 and Snow et al. each do not teach an optical lead having an angle cut end face as called for in Applicant's claim 15.

In regards to Takahashi '681's ferrules 41 and 42, although Takahashi '681 shows

ferrules 41 and 42 as each having an angled end, the Applicant submits that Takahashi ‘681’s ferrules 41 and 42 are not optical fibers.

On page 9, lines 17-20 of the Office Action, the Office stated:

“While the reference does not explicitly show a fiber having an angle cut terminus, fibers (33 and 34) are understood to be in the ferrules (41 and 41) to permit light transmission discussed above and it would have been obvious to one of ordinary skill in the art that the fibers would have an end face similar to that of the ferrules.”

Although the Applicant agrees with the Office that Takahashi ‘681 does not show a fiber having an angle cut terminus, the Applicant respectfully disagrees with the Office’s statement that Takahashi ‘681’s optical fibers 33 and 34 have angle cut terminus because Takahashi ‘681’s ferrules 41 and 42 have angle cut terminus.

Note in Takahashi ‘681’s Figure 4 and Takahashi ‘681’s column 6, lines 29-43 wherein Takahashi ‘681’s teaches that the transfer of an optical power can occur with the presence of a gap/space located between the ferrule and in turn the optical fibers. Since the transfer of an optical power can occur with the presence of a gap/space located between the ferrule and in turn the optical fibers, the Applicant respectfully submits that the aforementioned is evidence that the presence of angle cut terminus on Takahashi ‘681’s ferrules 41 and 42 does not translate to Takahashi ‘681’s optical fibers 33 and 34 having angle cut terminus in order for Takahashi ‘681’s to transfer of optical power.

In further regards to Applicant's dependent claims 2-10, 12-14, and 17-20, Applicant's dependent claims 2-10 each depend on Applicant's independent claim 1 and Applicant's dependent claims 12-15 each depend on Applicant's independent claim 11. Since Applicant's independent claim 1 and Applicant's independent claim 11 are allowable for the reasons given above, Applicant's dependent claims 2-10 and 12-14 should also be allowable. Applicant's dependent claims 17-20 each depend on Applicant's independent claim 16. Since Applicant's independent claim 16 is allowable for the reasons given above, Applicant's dependent claims 17-20 should also be allowable.

In view of the above, it is submitted that the application is in condition for allowance. Allowance of claims 1-20, as amended, is respectfully requested. Applicant has enclosed a version of the amendment showing changes made with this response.

Respectfully submitted,

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